

REMARKS

Claims 1-16, 18, 20-22, and 24 were examined. Claim 1 is amended. Applicant thanks the Examiner for the continued allowability of claims 20-22 and 24. No new matter has been presented.

CLAIM 1 IS ALLOWABLE OVER FURENDAL

Claim 1-9 were rejected under 35 USC 102(b) as being anticipated by US Patent No. 4,293,596 to Furendal et al. (hereinafter “Furendal”). Applicant respectfully overcomes the rejection.

Amended claim1 recites exposing the organic film to a vapor of a solvent for a period of time sufficient to render at least an outermost portion of the organic film insoluble in the solvent, wherein insolubility of the outermost portion results directly from vapor annealing without other assistance. Support can be found in the present application at page 3 lines 29-30 and in the example on page 4, lines 7-16 showing insolubility resulting directly from vapor exposure without assistance such as heating. The insolubility is directly resulting from film exposure to the vapor, and the resulting outer layer of the film is insoluble in the same solvent that provided the vapor. All examples provided by Furendal fail to show that the resulting film is insoluble in the same solvent that provided the vapor and formed without assistance such as heat treatment or a catalyst.

Furendal shows that it is using chemical cross-linking to achieve improved insolubility and this improvement is a result of heat generated cross-linking or the use of catalysts. More specifically, Furendal states that the cross-linking takes place during heating (see below), and it is the cross-linking that provides the solvent resistance (see col. 8 lines 13-14, 35-36). Specifically, Example 16 states that, “The coating did not swell at all, which shows that cross-linking took place between the oxirane groups during the heat treatment after the solvent treatment.” Example 29 states that, “The coating swelled insignificantly, which shows that cross-linking took place between the oxirane and the carboxylic acid groups during the heat treatment after the solvent treatment.”

Although Furendal teaches that efforts may be taken to optimize heat economy, there is no suggestion that the heating step is removed (Col. 12, lines 16-31). Similarly, Col. 11 lines 63-65 cited by the Office showing the use of a catalyst shows that assistance is required for the

cross-linking of Furendal to occur (either by catalyst or by heat). Mere exposure to vapor seems insufficient.

Applicant also submits that the Office's assertion that heat is used to dry the solvent *after* the solvent treatment is directly contradicted in the very section cited in support of that assertion. Specifically, column 15, lines 19-22 state “[t]he drying should appropriately be carried out directly in connection with the treatment with the solvent. Previous heating can than [sic] be utilized, and it also facilitates the recovery of solvent.”

Accordingly, Furendal does not show or suggest a film wherein insolubility of the outermost portion results directly from vapor annealing without other assistance. Based on the aforementioned, Claim 1 and its dependent claims are believed to be in condition for allowance.

CLAIM 10 IS ALLOWABLE OVER FURENDAL

Claim 10-16 and 18 were rejected under 35 USC 103(a) as being obvious in view of Furendal. Applicant respectfully traverses the rejection.

Claim 10 requires placing a solution containing an organic material and a first solvent on a substrate; evaporating the first solvent from the solution leaving an organic film on the substrate; annealing the organic film by exposing it to a vapor of a second solvent for a period of time sufficient to render at least an outermost portion of the organic film insoluble in the first solvent, wherein the first solvent and second solvent are the same solvent. This means that the solution when deposited, also contains the same solvent that is used in the vapor to anneal the film. In the examples provided by Furendal, the main solvent used to form the film is water. None of the Furendal examples, however, use water vapor to anneal the film.

Per MPEP 2143.01, the proposed modification cannot change the principle of operation of a reference.

The Office suggests that is would be fairly straight forward (an obvious design choice) to replace the mostly water based solvents with another solvent, particularly those solvents cited on page 5 line1-2 for use in cross-linking the films of Furendal. However, such a radical change in solvent will likely require a substantial reconstruction and rework of Furendal so as to be outside the bounds of reasonable predictability or expectation of success. Specifically, Furendal requires that cross-linking must not take place until after treatment with solvent (Col. 8, lines 34-39). However, the Office now suggests taking the same solvent that causes cross-linking and placing such a cross-link causing solvent into the solution that will be deposited on the substrate.

Applicant respectfully submits that such a change is entirely unpredictable as to the results. The placement of the cross-link causing solvent into the solution may cause cross-linking to immediately occur. As Furendal is a patent related to paints and improved paints (Col. 1, lines 6-10), the proposed modification could render the Furendal reference unsatisfactory for its intended purpose as the solvent may cause the paint to harden in the can or container, prior to application since the cross-linking solvent is already in the solution prior to deposition. Optionally, the solvent in the solution may not cause cross-linking to occur completely, but it may cause partial cross-linking that would render the paint unsatisfactory for its intended purposes.

Per MPEP 2143.02, the Office must show that there is reasonable expectation of success.

As noted in the present application, it is a surprising result that the invention of claim 10 is successful where the solvent from the solution may also be used to anneal the resulting film. Per MPEP 2143.02, the Office must show that there is reasonable expectation of success for the proposed modification. In the chemical arts, Applicant respectfully submits that the changes suggested by the Office of placing the solvent used for cross-linking into the solution prior to deposition is highly unpredictable and that it is the burden of the Office to show that there is a reasonable expectation of success. Without further significant experimentation, it would seem difficult to be reasonably certain that placing the cross-linking agent (the solvent) into the solution prior to deposition would not cause complete cross-linking, partial cross-linking, or some other disruption to occur when the solvent is introduced or over time thereafter. Applicant respectfully submits that without a showing of a reasonable expectation of success for the proposed modification, particularly one that shows that the solution will not begin to cross-link and hardening in a premature manner, the rejection of claim 10 and its dependent claims over Furendal should be withdrawn.

CONCLUSION:

For the reasons set forth above, the Applicant submits that all claims are allowable over the cited art and define an invention suitable for patent protection. The Applicant therefore respectfully requests that the Examiner enter the amendment, reconsider the application, and issue a Notice of Allowance in the next Office Action.

Respectfully submitted,

/Hao Y. Tung/

Hao Y. Tung, Reg. No. 43,209
Patent Attorney

Date: April 30, 2008

NANOSOLAR, INC.
5521 Hellyer Avenue
San Jose, CA 95138
tel.: (408) 365-5960
fax.: (408) 365-5965